

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 74539
WEST BRIDGE STREET
OVER THE
STRAIGHT RIVER
DISTRICT 6 - STEELE COUNTY



PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION
BY
COLLINS ENGINEERS, INC.
JOB NO.5221

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected below water at Bridge No. 74539, Piers 1 and 2 and the East Abutment, were found to be in good condition. The concrete was generally in smooth and sound condition with random vertical minor cracking noted along the pier shafts and the abutment breastwall. The channel bottom appeared to be stable with no appreciable scour observed.

INSPECTION FINDINGS:

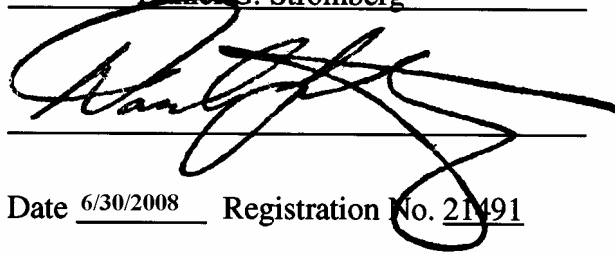
- (A) The concrete pier shafts at Piers 1 and 2 exhibited several random hairline to 1/32-inch-wide cracks that typically extended the full height of the shaft.
- (B) The East Abutment breastwall exhibited several random hairline to 1/16-inch-wide cracks that extended the full height of the wall.

RECOMMENDATIONS:

- (A) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

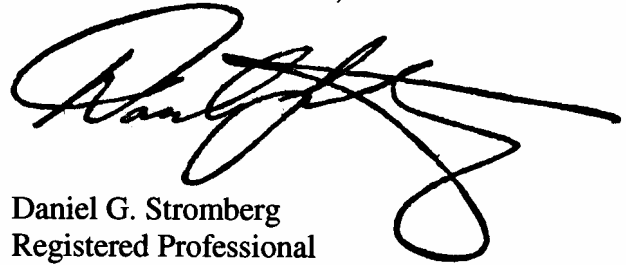
Daniel G. Stromberg

A large, stylized handwritten signature in black ink, appearing to read 'Daniel G. Stromberg', is written over two horizontal lines.

Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

A large, stylized handwritten signature in black ink, appearing to read 'Daniel G. Stromberg', is written over two horizontal lines.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 74539

Feature Crossed: Straight River

Feature Carried: West Bridge Street

Location: District 6 – Steele County

Bridge Description: The superstructure consists of a three-span continuous concrete structural slab that is 22 inches thick at the midspans and 37 inches thick at the haunches (over the substructure units). The bridge is supported by two reinforced concrete abutments and two reinforced concrete piers. The piers are numbered 1 and 2 from west to east.

2. INSPECTION DATA

Professional Engineer Diver: Daniel G. Stromberg
State of Minnesota, P.E., No. 21491

Dive Team: Clayton G. Brookins, Valerie Roustan

Date: October 22, 2007

Weather Conditions: Partly cloudy, $\pm 48^{\circ}$ F

Underwater Visibility: ± 0.5 foot

Waterway Velocity: ± 2.0 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2 and the East Abutment.

General Shape: Piers consist of oblong rectangular shafts with rounded ends and are supported by steel H-piles encased in the shafts. The abutment consists of a vertical breastwall with skewed wingwalls.

Maximum Water Depth at Substructure Inspected: Approximately 7.5 feet at Pier 2.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap at the north end of Pier 1.

Water Surface: The waterline was approximately 7.8 feet below reference.
Waterline Elevation = 1126.2.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

Item 61: Channel and Channel Protection: Code 8

Item 92B: Underwater Inspection: Code B/10/07

Item 113: Scour Critical Bridges: Code N/Unknown

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

 Yes X No



Photograph 1. Overall View of Bridge, Looking Southeast.



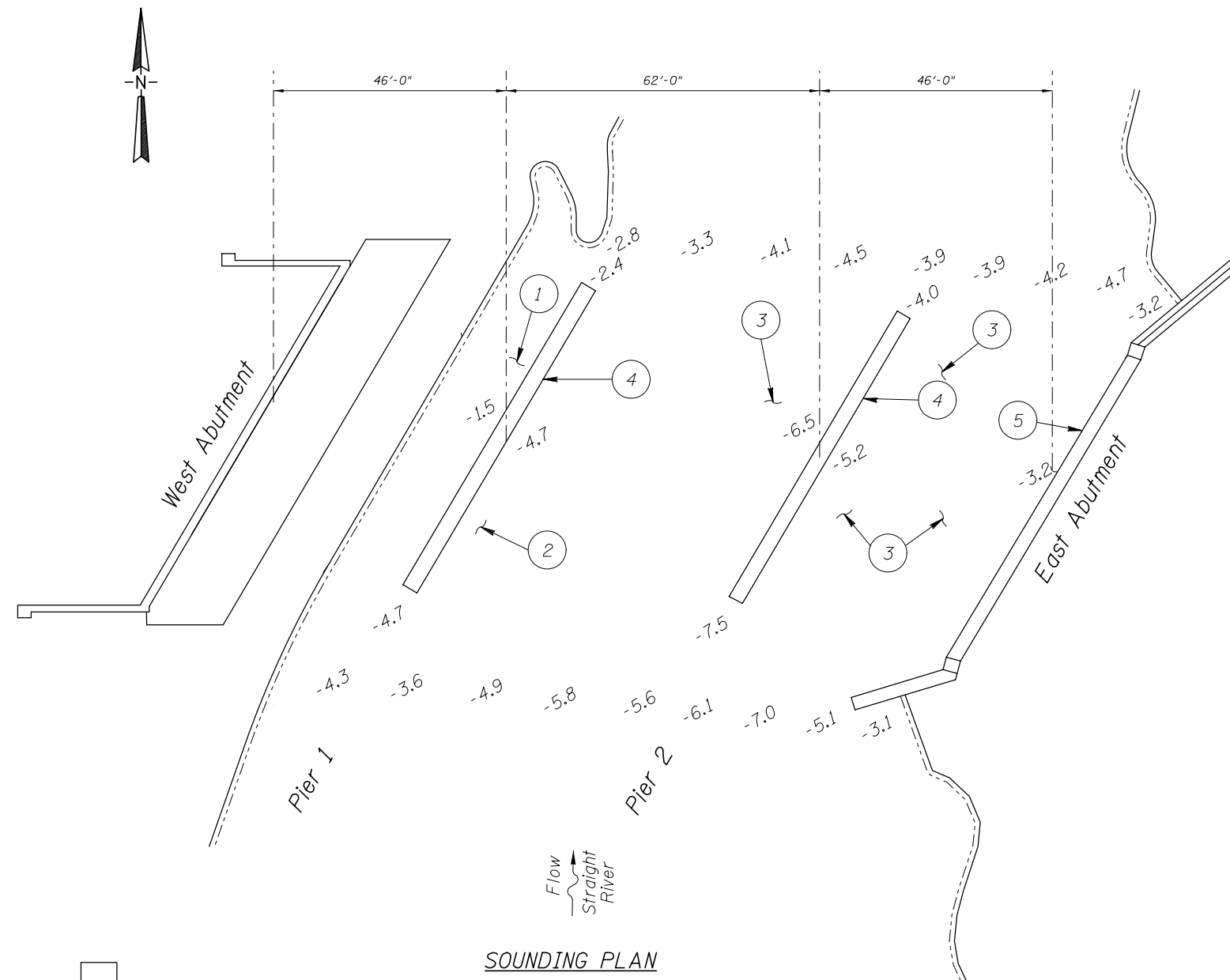
Photograph 2. View of Pier 1, Looking Southeast.



Photograph 3. View of Pier 2, Looking Southeast.



Photograph 4. View of the East Abutment, Looking North.



INSPECTION NOTES:

- 1 The channel bottom consisted of soft silt and organics with up to 2 feet of probe rod penetration.
- 2 The channel bottom consists of silty sand and 2-foot-diameter and smaller rock with up to 3 inches of probe rod penetration.
- 3 The channel bottom consists of 2-foot-diameter and smaller rocks and gravel with soft silt infilling along the eastern side of the downstream nose of Pier 2.
- 4 Random vertical hairline to 1/32-inch-wide cracks were observed along the concrete pier shafts.
- 5 Random vertical hairline to 1/16-inch-wide cracks were observed along the East Abutment breast wall.

GENERAL NOTES:

1. The East Abutment and Piers 1 and 2 were inspected underwater.
2. At the time of inspection, on October 22, 2007, the waterline was located approximately 7.8 feet below the top of Pier 1 on the downstream end. This corresponds to a waterline elevation of 1126.2 feet.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units as well as around the pier structures.

Legend

- 0.4 Sounding Depth (10/22/07)
- Timber Debris

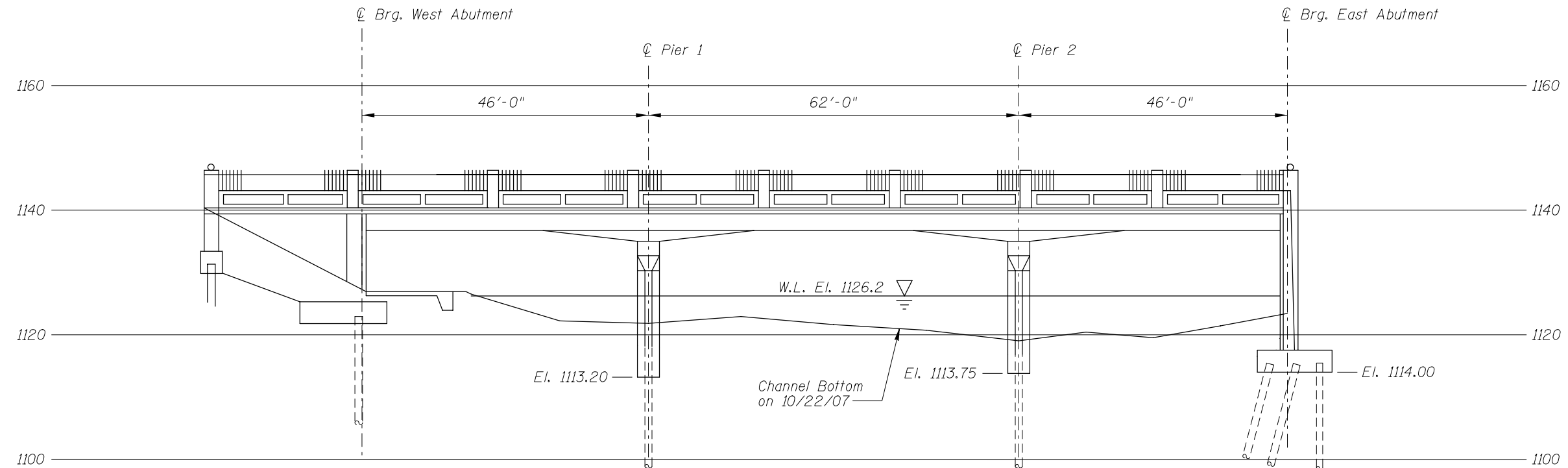
TYPICAL END VIEW OF EACH PIER SECTION

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION

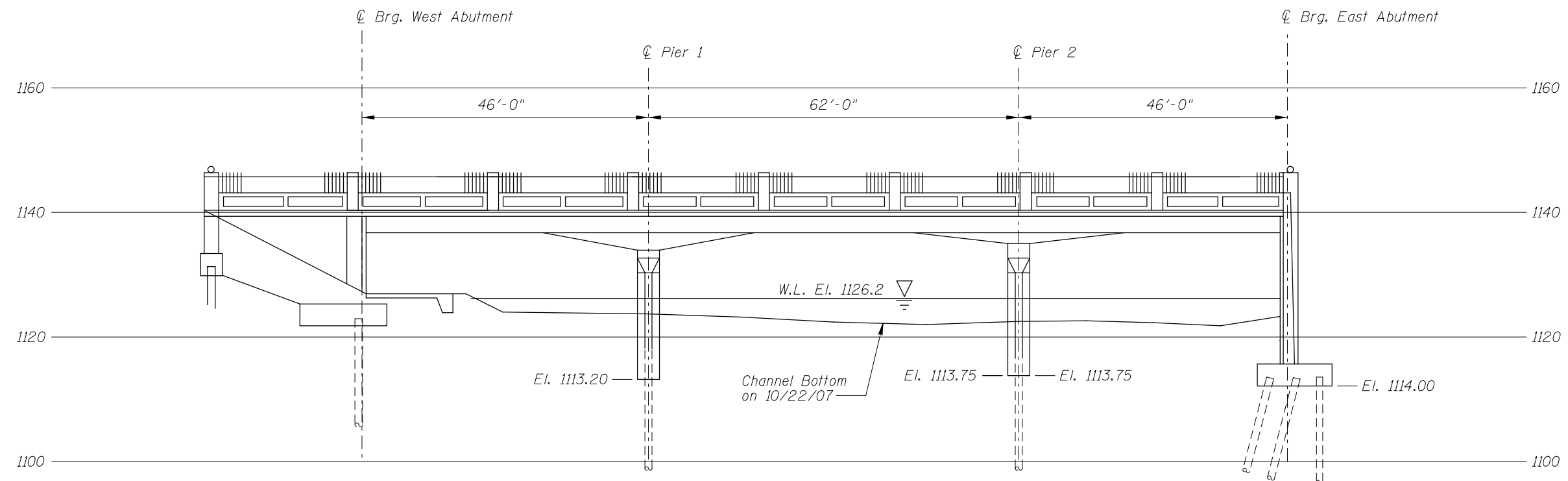
STRUCTURE NO. 74539
MSAS 109 OVER THE STRAIGHT RIVER
DISTRICT 6, STEELE COUNTY

INSPECTION AND SOUNDING PLAN

Drawn By: RR	COLLINS ENGINEERS	123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: OCT, 2007
Checked By: VR			Scale: NTS
Code: 52214539			Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:
Refer to Figure 1 for General Notes.

**MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION**

STRUCTURE NO. 74539
MSAS 109 OVER THE STRAIGHT RIVER
DISTRICT 6, STEELE COUNTY
**UPSTREAM AND DOWNSTREAM
FASCIA PROFILES**

Drawn By: RR	COLLINS ENGINEERS <small>133 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: OCT, 2007
Checked By: VR		Scale: 1"=20'
Code: 52214539		Figure No.: 2

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: October 22, 2007

ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E.

BRIDGE NO: 74539 WEATHER: Partly Cloudy, ±58° F

WATERWAY CROSSED: Straight River

DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Clayton G. Brookins, Valerie Roustan

EQUIPMENT: Scuba, U/W Light, Scraper, Lead Line, Sounding Pole, Probe Rod, Camera

TIME IN WATER: 5:20 P.M.

TIME OUT OF WATER: 5:50 P.M.

WATERWAY DATA: VELOCITY ± 2 f.p.s

VISIBILITY ± 0.5 feet

DEPTH 7.5 feet maximum at Pier 2.

ELEMENTS INSPECTED: Piers 1 and 2 and the East Abutment

REMARKS: The concrete was in smooth and sound condition with random vertical hairline to 1/32-inch-wide cracking observed in the shafts of Piers 1 and 2 and random hairline to 1/16-inch-wide cracking observed along the breastwall of the East Abutment. The channel bottom typically consisted of 2-foot-diameter and smaller riprap with soft silt interspersed having up to 3 inches of probe rod penetration. There was also some very soft infilling along the west side of Pier 1.

FURTHER ACTION NEEDED: YES X NO

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 74539
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Daniel G. Stromberg, P.E. 21491
WATERWAY CROSSED The Straight River

INSPECTION DATE October 22, 2007
NOTE: USE ALL APPLICABLE CONDITION
DEFINITIONS AS DEFINED IN THE MINNESOTA
RECORDING AND CODING GUIDE INCLUDING
GENERAL, SUBSTRUCTURE, CHANNEL AND
PROTECTION, AND CULVERTS AND WALL
DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

UNIT REFERENCE NO.	UNIT DESCRIPTION	MAXIMUM DEPTH OF WATER	SUBSTRUCTURE						CHANNEL					GENERAL					
			PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 1	4.7'	N	7	N	9	N	7	8	8	8	N	8	7	N	N	N	N	N
	Pier 2	7.5'	N	7	N	9	N	7	8	N	N	N	8	7	N	N	N	N	N
	East Abutment	3.2'	N	7	N	9	N	7	8	N	N	N	8	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: The concrete was in smooth and sound condition with random vertical hairline to 1/32-inch-wide cracking observed in the shafts of Piers 1 and 2 and random hairline to 1/16-inch-wide cracking observed along the breastwall of the East Abutment. The channel bottom typically consisted of 2-foot-diameter and smaller riprap with soft silt interspersed having up to 3 inches of probe rod penetration. There was also some very soft infilling along the west side of Pier 1.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.